

Traffic Clearance System for Emergency Vehicals

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Abstract: *The Smart Traffic Management System with Ambulance Detection is an IoT and computer vision-based solution that prioritizes emergency vehicles. It automatically detects ambulances using OpenCV to process images of red-cross patterns. The system uses a Raspberry Pi 4B to control LED traffic lights, a servo-controlled camera, and emergency indicators. A Flask web dashboard allows for real-time monitoring and control.*

Key functions include automating three-way traffic lights, rotating the camera in real time, activating a 30-second green light priority mode, providing analytics, and featuring a test mode. The system achieved a 95% detection accuracy in different lighting conditions and reduced response time to under 3 seconds. This improvement supports emergency response while keeping overall traffic efficiency high.

Keywords: Traffic Management, Computer Vision, IoT, Raspberry Pi, Emergency Vehicle Detection, Smart Cities

